

Decision by ethnic group and sex. Values are numbers of applicants (percentages of group; percentages of each decision category)

Decision category	Ethnic group			P value of white v non-white	Sex			P value of male v female
	White	Non-white*	Total		Male	Female	Total	
Total No of applicants	1954 (76.8)	591 (23.2)	2545†		1279 (47.3)	1422 (52.7)	2701	
Rejection at:								
Academic stage	384 (69.4; 19.6)	169 (30.6; 28.6)	553 (21.7)	<0.0001	230 (57.4; 18.0)	171 (42.6; 13.0)	401 (14.8)	<0.0001
Questionnaire stage	1015 (74.6; 51.9)	345 (25.4; 58.4)	1360 (53.4)	<0.01	848 (49.3; 66.3)	871 (50.7; 61.3)	1719 (63.7)	<0.0001
Statement review	189 (87.9; 9.7)	26 (12.1; 4.4)	215 (8.5)	<0.0005	74 (38.1; 5.8)	120 (61.9; 8.4)	194 (7.2)	<0.005
Interview	165 (88.2; 8.4)	22 (11.8; 3.7)	187 (7.4)	<0.0005	47 (32.4; 3.7)	98 (67.6; 6.9)	145 (5.4)	<0.005
Offered a place	201 (87.4; 10.3)	29 (12.6; 4.9)	230 (9.0)	<0.0005	80 (33.0; 6.3)	162 (67.0; 11.4)	242 (9.0)	<0.0005

*Asian (Bangladeshi, Chinese, Indian, Pakistani, other Asian) and black (African, Caribbean, other black)

†Does not include 157 candidates whose ethnic group was not supplied to Universities and Colleges Admission Service.

sonality, communication skills, and interest in medical topics are assessed and scored. Offers are made to the 260 interviewees with the top scores.

In 1997, 2701 candidates from the United Kingdom and the rest of the European Union applied to Nottingham through the Universities Colleges and Admission Service. The decision for each applicant was noted along with ethnic group, sex, and stage of the process. Statistical comparison of frequencies was by χ^2 test with Yates's correction.

Significantly more non-white and male applicants were rejected at the academic and questionnaire stages, whereas significantly more white and female applicants were rejected at the statement review and interview stages (table). The net effect was that significantly more white and female applicants were offered a place.

Comment

Discrimination is "the unfair treatment of a person based on an irrational preference."² Selection by ethnic group or sex would be discriminatory because neither predicts success in a medical course or career. We believe, however, that the higher rates of offers to female and white applicants do not represent discrimination. They arise at the academic and questionnaire stages, which are objectively scored without reference to ethnic group or sex. Indeed, at the statement review and interview, where true discrimination could operate, non-white and male applicants are significantly more likely to be offered a place.

Selection on the basis of academic ability is reasonable: a proved relation exists between this and success on a medical undergraduate course.⁴ Our unpublished data for the first 21 years of Nottingham Medical

School show that scores at O level or GCSE and A level are significant independent predictors of success at all stages of the course. Unlike in McManus's study, for most applicants we can select only on achieved GCSE and predicted A level grades rather than achieved A level grades.

Nottingham Medical School is the only one to use a questionnaire in selection. It aims at avoiding discrimination by consistently scoring, for all academically suitable applicants, non-academic factors considered relevant to a career in medicine. We now question, however, whether such factors accurately reflect suitability for medicine. Our goal is that selection is only on the basis of evidence based predictors of success, including perhaps psychometric testing.⁵

We encourage all medical schools in the United Kingdom to examine their admission practices as we have done to ensure that the process is fair and non-discriminatory.

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Competing interests: None declared.

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Comparative efficacy of three mumps vaccines during disease outbreak in eastern Switzerland: cohort study

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After the introduction of immunisation against measles, mumps, and rubella, numerous outbreaks of mumps were reported in the 1980s and '90s in Switzerland and southern Europe.^{1 2} The Rubini strain

is still widely used in Europe,³ and we report here a large outbreak of mumps in a population with a high vaccination rate and examine the differential efficacy of the three vaccine strains.

Participants, methods, and results

An outbreak was investigated in a small village in Switzerland. All children (ages 5-13) were included in the cohort. Information on immunisation status was obtained from vaccine certificates. The person who investigated the cases of mumps was blinded with regard to the vaccination status. A case was defined if mumps virus was isolated on culture, if a doctor confirmed the diagnosis, or if the typical clinical picture was described in a sibling of a patient with confirmed disease. The absence of IgG antibodies to mumps virus served as confirmation of full susceptibility to mumps in non-vaccinated children without clinical signs of the disease.

The cohort comprised 165 children. All questionnaires sent to their parents were returned and evaluated (response rate 100%). All immunised children had received their immunisation before the age of 2 years, almost half with the Rubini strain (table). Sixty six cases of epidemic parotitis occurred, resulting in an overall attack rate of 40%. Altogether 11(16%) children had parotid enlargement without fever; only one case (vaccinated with the Rubini strain) had a complicated course that required hospital admission. The attack rate was similar in unvaccinated children (63%) and children vaccinated with the Rubini strain (67%) but significantly lower in those vaccinated with the Jeryl-Lynn (14%) or the Urabe strain (8%) (table). When the attack rate for the two currently available vaccine strains was compared the relative risk of developing mumps was 4.8-fold greater (95% confidence interval 2.1 to 11.1) in children vaccinated with the Rubini compared with the Jeryl-Lynn strain. The low vaccine efficacy of the Rubini strain was observed throughout all age groups. In contrast, cases of mumps in children vaccinated with the Jeryl-Lynn or Urabe strains occurred only at the age of 8 or older. In the three vaccine categories no difference in the severity of mumps was observed.

Comment

More than a decade after systematic vaccination was introduced, the incidence of mumps is still high in Switzerland, Spain, and Italy. Several explanations for this are under discussion: inadequate vaccination rates, natural periodicity, and other factors such as differences in viral strains and loss of mucosal immunity. This study is notable because it describes an outbreak in a rural population with a high vaccination rate (95%). The attack rate of 63% in the unvaccinated group is consistent with other published reports. When compared with no vaccination, immunisation with the Rubini strain resulted in no detectable benefit.

Several serological surveys show comparable sero-conversion rates for the Rubini, Jeryl-Lynn, and Urabe strains, but under field conditions other variables might be more relevant. This study supports the general importance of postmarketing surveillance.

To eliminate a disease a vaccination programme must achieve a high coverage with a vaccine that results in a substantial (>85%) vaccine efficacy.⁴ The Rubini strain investigated in this study clearly did not fulfil the second requirement. From a public health perspective, immunisation against mumps with the Rubini strain should be strongly discouraged unless the field efficacy of this vaccine is convincingly shown.

Attack rate and vaccine efficacy stratified by vaccine strain

	No of children exposed (% of all children)*	No of cases of mumps	Attack rate (%) (95% CI)†	Vaccine efficacy (%) (95% CI)‡	P value§
No (%) vaccinated	8 (5)	5	63 (17 to 92)		
Vaccine strain:					
Rubini	79 (48)	53	67 (54 to 78)	-4 (-218 to 15)	1.00
Jeryl-Lynn	36 (22)	5	14 (3 to 31)	78 (64 to 82)	0.03
Urabe	40 (24)	3	8 (1 to 22)	87 (76 to 94)	0.02

*Vaccine strain not specified in two children without mumps (who were excluded).

†Attack rate was defined as proportion of children with mumps/all vaccinated children, and 95% confidence intervals were calculated using approximation by Bailey (Systat for Windows Ver. 5).

‡Vaccine efficacy for each strain was calculated by equation of Orenstein (vaccine efficacy (%)=(1-(attack rate in vaccinated children/attack rate in unvaccinated children))×100).

§Significance of differences between attack rates in vaccinated and unvaccinated children (Fisher's exact test, two sided, adapted according to Bonferroni-Holm).

A second vaccination dose is generally recommended between the ages of 7 and 10 years. Other countries, such as Finland, eliminated indigenous mumps by instituting a two dose regimen with the Jeryl-Lynn strain.⁵ In agreement with this recommendation, we found no cases of mumps in children under 7 vaccinated with the Jeryl-Lynn or Urabe strain.

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Endpieces Cigarettes are sexy

His hands in his pockets with the thumbs hooked over the denim and a fag hanging from his mouth. It got me then and it gets me now: cigarettes are sexy—they're worth the stench and the cancer.

Roddy Doyle, *The Woman who Walked into Doors*, 1996